

Task 2: Developing Proactive Methods for GA Data Collection (Hackworth)

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Project Start Date: 10/1/2007

Anticipated End Date: 5/31/2010

Requirements Statement
<p>Operational Shortfall or Knowledge Gap</p> <p>General Aviation (GA) safety data are limited. In fact, accident data and analyses (e.g., NTSB investigations, which sometimes include incidents), insurance exposure data, and Aviation Safety Reporting System (ASRS) reports are the only widely available sources of risk information for GA operations. Accident data have been analyzed from a variety of perspectives and with many positive effects, though these are more notable in commercial air transport than GA. ASRS has produced numerous alerts of potential safety issues over a 30-year period. In the airline community, with the declining frequency of accidents, emphasis has moved from accident data to more proactive and normative data sources and risk analysis. This transition has provided a number of positive changes – airlines and the Federal Aviation Administration (FAA) are able to show actions taken to address incidents and trends before they result in accidents – though their independent effect on accident rates has yet to be demonstrated.</p>
<p>Benefit in Closing the Shortfall or Gap</p> <p>This project will begin to experiment with more proactive data sources that might be available or developed for GA. The initial focus will include pilot deviations, requests for flight assistance, emergency declarations, and weather-related events gathered by the Center for General Aviation Research (CGAR). Weather causal factors will be the primary areas of interest including: 1. Visual Flight Rules (VFR) flight into Instrument Meteorological Conditions (IMC), 2. convective and icing encounters, 3. instrument-rated pilot control difficulties in actual IMC, and 4. Instrument Flight Rules (IFR) compliance with Instrument Approach Procedures (IAPs). The basic strategy will be to pursue a thorough and detailed examination of data derived from weather-related events in order to develop disciplined methods of analyzing future events, so that investigators may better learn from these weather-related events, improve correction of involved personnel, and generate interventions to prevent future events. These efforts will support future agency decisions about weather information and systems.</p>
<p>Description of the Desired Product</p> <p>An assessment is needed of what types of data collection are possible and viable in GA, along with identification of external information necessary to make data collection valuable and meaningful in the prevention of future accidents. Experiment with potential sources of more proactive data for GA and determine what infrastructure and analytical processes or strategies would be required for their use in risk assessment and accident prevention. Arriving at an interview protocol for investigators that would elicit data necessary to populate the analytic framework for future weather-related events.</p>

Schedule

Report of impressions and findings common across examined events including possible interventions conceived through incident review.

Research Objective

Experiment with potential sources of proactive data for GA and determine what infrastructure and analytical processes or strategies would be required for their use in risk assessment and accident prevention. An assessment is needed of what types of data collection are possible and viable in GA, along with identification of external information necessary to make data collection valuable and meaningful in the prevention of future accidents. This may require experimentation with a variety of methods, such as collecting information about incidents and similarly situated flights, exploring availability of weather information and limitations of radar track information, and identifying potential methods for capturing other information about GA aircraft operations.

Prerequisite to development and implementation of such data sources is evidence that using data other than from accidents can lead to actions that reduce risk. Initial work with pilot deviation, flight assistance, emergency declaration, and incident data focusing on weather issues will allow assessment of viability of research with potential accident precursors.

Background

Though the FAA, airlines, and their employee representatives have undertaken more proactive approaches to identify risk through Flight Operational Quality Assurance (FOQA) data and internal safety reports, GA safety remains driven primarily by accident investigation. Accident analyses and reports to ASRS have been the primary means of identifying safety issues and developing interventions. This project will explore whether more proactive data could be captured for GA enabling more proactive approaches to risk management. Initial experimentation will involve pilot deviations, requests for flight assistance, emergency declarations, and weather-related events. Weather causal factors will be the primary areas of interest including, VFR flight into IMC, convective and icing encounters, instrument-rated pilot control difficulties in actual IMC, and IFR compliance with IAPs.

Previous Activity on this Task

During FY08, 21 interviews were completed with pilots that had experienced a weather-related event. Preliminary results from this study suggest that reasons GA pilots decide to fly into adverse weather varied greatly. While it appears that some adverse weather encounters are due to the motivation to get to their destination and may result in violations, many more are due to a lack of understanding/appreciation of the weather conditions, and /or incomplete, or conflicting weather information.

During FY09, CAMI and Clemson personnel examined pilots' experiences of recent weather encounters in order to develop disciplined methods of analyzing future events, so that investigators may better learn from these weather-related events, improve correction of involved personnel, and generate interventions to prevent future events. This involved developing a detailed understanding of sampled weather-related events and interventions that might prevent each. CAMI and Clemson conduct 25 interviews. We examined interview data from the 25 weather-related events. Clemson will report impressions and findings common across examined incidents, including possible interventions conceived through incident review.

Proposed or Planned Research

This year CAMI, Clemson University, and ERAU personnel will finalize a technical report summarizing the interview and weather data collected during the project.

Research Question(s)

What potential sources of proactive GA data exist or could be captured and collected?

What utility can be demonstrated with samples of more proactive data?

What advances in coding schemes or analysis strategy are required to make use of this data in GA risk assessment?

Technical Approach

Current Year

This year CAMI, Clemson University, and ERAU personnel will finalize a technical report summarizing the interview and weather data collected during the project.

Out-Years

NA

Air Traffic Resources Required

None

Information Technology Resources Required

None

Calibration

None

FY10 Milestone Schedule		
Description	Proposed Start Date	Proposed Completion Date
Final report summarizing all weather data	FY09 Q2	FY09 Q4

FY10 Deliverables		
Description	Proposed completion date	Actual completion date
Data Collection	FY 09 Q2	FY09 Q2
Draft report summarizing Interview Data	FY 08 Q4	FY08 Q4
Draft report recommending interventions for weather-related events	FY 09 Q4	FY09 Q4
Final report recommending interventions for weather-related events	FY10 Q2	